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A New Nearctic Species of *Karpinskiella*

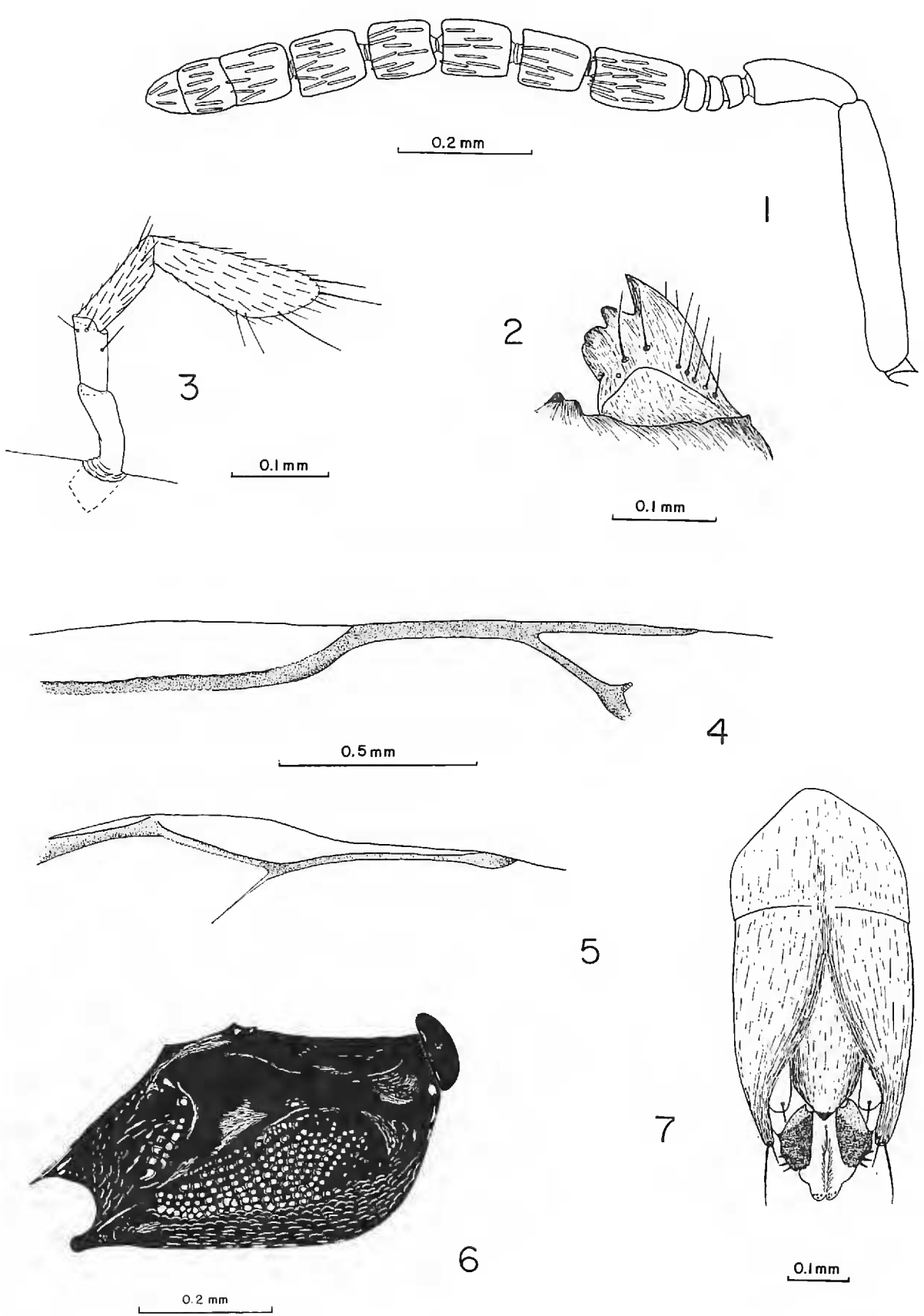
(Hymenoptera : Pteromalidae)

K. S. HAGEN AND L. E. CALTAGIRONE

University of California, Berkeley

In the Pteromalidae, *Tomicobia* is one of a few genera that contain species that attack adult scolytid beetles (Hopkins 1913, Reid 1957, Hedqvist 1959, Bushing 1965). Mr. M. M. Furniss, U.S.D.A. Forest Service, Moscow, Idaho, reared a pteromalid from adults of *Dendroctonus* in Utah and suspected it to be *Tomicobia*. At the time, Dr. W. D. Bedard, U.S.D.A. Forest Service, Berkeley, California, was studying the biology of *Tomicobia tibialis* Ashmead associated with *Ips* in California, but did not rear any from *Dendroctonus* (Bedard 1965). This apparent difference in scolytid host preference prompted Mr. Furniss to send specimens of his Utah material to Dr. Bedard for comparison. Dr. Bedard discovered that though extremely close in resemblance there was a difference in the number of antennal ring segments between the Utah and California specimens.

The Utah specimens were brought to our attention for identification. We have decided that the Utah specimens belong in the genus *Karpinskiella*, which is closely related to *Tomicobia*. Both genera are separated



FIGS. 1-7. *Karpinskiella paratomicobia* Hagen and Caltagirone. FIG. 1. Antenna of female. FIG. 2. Right mandible of female. FIG. 3. Maxillary palpus. FIG. 4. Venation of forewing. FIG. 5. Venation of hind wing. FIG. 6. Lateral view of mesothorax. FIG. 7. Male genitalia, ventral view.

from all other pteromalids by the peculiar form of the abdomen (Hedqvist 1959). The presence of three antennal ring segments separates *Karpinskiella* from *Tomicobia*; the latter genus has only two ring segments.

Dr. Z. Bouček of Prague who described the genus *Karpinskiella* (Bouček 1955), concurred that the Utah species was congeneric with *Karpinskiella* but distinct from the only described species; thus the range of this Old World monobasic genus is now extended into the Nearctic region. Dr. B. D. Burks of the U. S. National Museum had already discovered that *Karpinskiella* occurred in North America, for he had determined specimens from California as belonging to this genus (Bushing and Bright 1965). This species is apparently still undescribed.

We are proposing a name, and describing the Utah species of *Karpinskiella* at this time so that Mr. Furniss can refer to a known taxon in his research on the biology of this parasite (Furniss 1968).

The majority of the paratypes are point mounted, but ten specimens are mounted on slides in a modified Faure mounting medium (Quednau 1964). The specimens on slides were cleared in chloralphenol. The specimens were mainly examined with a Leitz stereo microscope at magnifications up to 96 \times , using an incandescent lamp illuminator with a blue ground glass filter. The numerical measurements shown in the description are mostly in millimeters and are followed by values enclosed in parentheses; these are ranges in mm found in the specimens indicated in Table 1. The numerals with a colon between them are values expressing proportions determined by using an eye piece micrometer.

***Karpinskiella paratomicobia* Hagen and Caltagirone, new species**

FEMALE.—Length of holotype 3.04 mm, ♀ paratypes (2.30–3.20 mm). Head black with purplish and greenish metallic reflections when viewed from different angles; orbits and base of clypeus metallic bluish green; mandibles reddish brown, apices black. Antenna with scape yellowish brown; pedicel and ring segments shiny, piceous; flagellum dark brown clothed with grayish, flattened, appressed hairs arranged longitudinally. Thorax black with metallic reflections; mesonotum with bronzy dark purplish metallic reflections from certain angles; scutellum dark greenish bronzy without purplish tinge. Legs mainly yellowish brown; coxae dark brown ventrally, darker and with metallic reflections laterally; femora slightly darker than tibiae and tarsi. Wings hyaline with iridescent reflections; discal hairs brownish; submarginal and stigmal veins dark brown, marginal and postmarginal veins yellowish brown. Gaster dark brown, smoother, finely reticulate and less reflective than rest of body, sides with faint purplish reflections.

Head slightly wider than thorax, twice as wide as thick, one-fourth wider than

high; width 1.02 mm (0.8–1.02); oral margin truncate. Clypeus strongly outlined twice as broad as long with longitudinal converging striae, apical margin with two obtuse teeth. Fronto-vertex finely densely punctate, distance between punctures shorter than half the diameter of punctures; genae shagreened; silvery hairs semi-erect, scattered. Eyes 0.48 mm high (0.35–0.48), one third higher than wide with pale scattered inconspicuous short erect setae. Ocelli forming an obtuse triangle, lateral ocelli closer to center ocellus than to eye margins. Gena 0.29 mm (0.22–0.29), one-half height of eye. Antenna (fig. 1) arising below middle of face at a level slightly above lower margin of eyes; scape slender, cylindrical nearly attaining middle ocellus, length 0.48 mm (0.35–0.48); pedicel about twice as long as wide, longer than three ring segments; length flagellum plus pedicel and ring segments 0.96 mm (0.70–0.99). Left mandible tridentate, ventral tooth longest, curved inwardly and dorsally; middle tooth triangular with ventral edge longer than dorsal; dorsal tooth broadest apically and truncate; right mandible (fig. 2) similar to left but with dorsal tooth slightly notched thus appearing quadridentate. Maxillary palpi (fig. 3) 4 segmented, labial palpi 3 segmented.

Thorax one-third longer than wide, widest just before tegulae, slightly less than half as thick as long; disc of mesoscutum densely craterleted, crater rims contiguous; scutellum becoming finely reticulate, coarse posteriorly; scattered setae inconspicuous, short, dark; fimbriae near propodeal spiracle. Pronotum from base to connection with head about four times wider than long, collar 8 times wider than long. Notaulices oblique, attaining one-half distance of mesonotal disc longitudinally and one-third distance mesad from sides, mesal apices of notaulices separated by a distance slightly more than one length of a notaulix (23 : 30). Axillae about as wide as long, separated by a distance about one of their widths. Scutellum somewhat flattened. Propodeum with median longitudinal carina bifurcated at posterior fourth; surface enclosed by diverging carinae smooth; on each side with a lateral plica almost reaching the spiracle: spiracle short-oval, near round; a large depression situated mesad of each spiracle and another smaller but deep impression on each side just mesad of caudal origin of lateral plicae. Mesoepimeron and mesoepisternum sculptured as in figure 6.

Forewings nearly as long as body, three times longer than wide, broadly rounded apically; fringe short; discal setae from basal fourth to apex, brownish, separated from each other by one of their lengths. Veins (figs. 4, 5), submarginal extends not quite to one-half length of wing, twice as long as marginal and shorter than post marginal. Hind wing three times longer than wide, extends to apex of forewing's post marginal vein, tapers to narrowly rounded apex from basal third.

Foreleg with femur over three times as long as wide (64 : 20), thickest just beyond middle; fore tibia slightly shorter than femur (60 : 64) slightly constricted at middle on inner side. Middle femur four times longer than wide (60 : 15); middle tibia about eight times longer than wide (80 : 11). Hind leg with femur nearly 4 times longer than wide (80 : 19), and tibia slenderer (80 : 15), slightly dilated apically, with one spur; tarsal segments from base 20, 10, 9, 5, 10 in proportional lengths.

Gaster oval, subsessile, not quite twice as long as wide or high. First gaster tergite slightly longer than second; third, fourth and fifth subequal slightly shorter than second; sixth tergite about as long as second and last one-third

as long as sixth tergite. Apical margin of last sternite straight, without median projection. Surface finely reticulate, with scattered semi-erect pale setae; sixth tergite with scattered erect setae near posterior margin, last tergite with erect setae at apex dorsally. Ovipositor held obliquely in repose with apices directed dorsally, third valvula about twice as long as wide, truncate apically.

MALE.—Length of allotype 2.24 mm, paratypes ranging from 2.11 to 2.81. Similar to female, differing as follows: mandibles both tridentate, legs darker brown, gaster about one-third longer than wide about as long as thorax, genitalia as in fig. 7.

Holotype female.—Selected from a series that emerged from bark of *Pseudotsuga menziesii* infested with *Dendroctonus pseudotsugae* Hopkins collected by M. M. Furniss at BARNEY TOP (34 MILES EAST) AND LITTLE VALLEY (9 MILES WEST) OF PANGUITCH, GARFIELD COUNTY, UTAH; bark collected in September, 1960, yielded adult parasites the following spring. Hopkins No. 41431. Deposited in the United States National Museum, catalog number 70206.

Allotype, same data as that of holotype. *Paratypes*, among the 115 specimens, there are some with the same data as above, and others, all collected by M. M. Furniss, with the following collection data: Horse Creek, (34 miles east) of Panguitch, Utah, collected 2–4 September 1959 and emerged from isolated host beetles, *D. pseudotsugae* the following spring; these specimens bear Hopkins No. 41836-A. Another lot emerging from *P. menziesii* bark infested with *D. pseudotsugae* collected along the road between Birch Creek and Mud Lake (30 miles east-northeast) and Five Mile Bench (5 miles west) of Panguitch, Utah, Hopkins No. 41485.

Paratypes are deposited in the U. S. National Museum, Washington, D. C., the Canadian National Collection of Insects, Ottawa; the California Academy of Sciences, San Francisco, the University of California Insect Survey Collection, Berkeley, the U.S.D.A. Forest Service Intermountain Forest and Range Experiment Station, Forest Science Laboratory, Moscow, Idaho, and in the collection of the National Museum in Prague, Czechoslovakia.

There is no conspicuous variation in the type series other than size and a slight color variation in legs and gaster; the color is darker in some specimens. The variation in size of certain structures measured in part of series is shown in Table 1.

The posterior propodeal bifurcation of the median carina in a few paratypes begins near the middle of the propodeum instead of at the posterior fourth. The number of erect setae arising from the dorsum of submarginal vein varies between 11 and 14, but the space between the one or two setae near the apex of the submarginal (on the parastigma) and next basal setae is conspicuous and greater than between

TABLE 1. Variation in size of certain structures of *Karpinskiella paratomicobia* specimens collected near Panguitch, Utah.¹

SEX	No.	Body length		Wing length		Head width		Eye height		Gena length		Scape length		Flagell. length ²		Metatib. length	
		\bar{x}	sd	\bar{x}	sd	\bar{x}	sd	\bar{x}	sd	\bar{x}	sd	\bar{x}	sd	\bar{x}	sd	\bar{x}	sd
♂																	
	10	75.4 ± 8.0		71.3 ± 5.1		27.7 ± 1.8		12.3 ± .94		6.8 ± .66		12.5 ± 1.5		26.3 ± 1.8		25.5 ± 2.2	
♀																	
	25	88.6 ± 7.0		80.2 ± 6.1		29.8 ± 1.9		13.5 ± 1.1		7.4 ± .65		13.0 ± 1.2		26.8 ± 2.4		27.0 ± 1.9	

¹ Values are expressed in units of measurement: one unit = 0.033 mm.

² Flagellum plus pedicel.

any of the other setae; most setae separated by at least one of their lengths.

Karpinskiella paratomicobia differs in many characteristics from *K. pityophthori* Bouček, apparently the only other species described in the genus. *Karpinskiella paratomicobia* is larger, blackish with subtle metallic reflections and with the mesonotum sculptured with dense, small, circular, contiguous craterlets compared to the other species which is small, dark shining metallic greenish blue and with its mesonotal surface sculptured with polygonal reticulations. The scape of *K. paratomicobia* attains the median ocellus and the funicle segments are longer than broad while in Bouček's species the scape is much shorter and the funicle segments are transverse. The pronotum in *K. pityophthori* is quite declivous anteriorly dropping off immediately from the anterior margin of the mesonotum while in the new species the pronotum is flat almost collar-like at the mesonotal margin before tapering toward head, and the mesopleural ventral limit is distinctly margined in the smaller species. The distinct median carina and lateral posterior plicae on the propodeal disc also serve to distinguish *K. paratomicobia* from *K. pityophthori*, for the latter species lacks distinct propodeal carinae.

The male genitalia of *K. paratomicobia* is rather similar to that of *K. pityophthori* as illustrated by Hedqvist (1963), but the lateral margins of the digiti are inwardly arcuate in the later species and nearly straight in the former.

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Pheromone-mask by the Female *Dendroctonus pseudotsugae* Hopk., an Attraction Regulator¹
(Coleoptera : Scolytidae)

J. A. RUDINSKY
Oregon State University, Corvallis

A new phenomenon is described in which the female Douglas-fir beetle, *Dendroctonus pseudotsugae* Hopk. (Coleoptera: Scolytidae), masks its own pheromone and rapidly stops the mass attraction of flying beetles; the stridulation of the male was found to trigger this masking. The effect of all pheromone including the residue in the frass is negated, but the primary attraction to host oleoresin and terpenes is not affected.

Earlier studies showed that unmated, sexually mature female beetles of this species feeding in the bark of the host tree produce an attractant that aggregates the population around the invaded tree (Rudinsky, 1961; McMullen and Atkins, 1962). Both sexes respond but in the ratio of two males to one female. The attracted females search for a suitable place to enter the bark and the males enter the individual female galleries and copulate, often some time later. At this point, the population aggregation to such a tree or log drops very suddenly. Since it is known that mating stops the pheromone production, the field methods used in earlier attraction studies (Rudinsky, 1963) were modified to eliminate mating as the act terminating the attraction.

Briefly, 30 sexually mature but unmated females were introduced into the bark of log sections and sealed off by a metal screen (mesh 24 × 24) to prevent entry of males but allow escape of volatile at-

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